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The Second International Symposium on Flash Floods in Wadi Systems

Disaster Risk Reduction and Water Harvesting in the Arab Region

25 – 27 October 2016

Technische Universität Berlin, Campus El Gouna, Egypt



Supported by:

Global Alliance of Disaster Research Institutes (GADRI), DPRI, Kyoto University



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Preface

In recent years, flash floods in Wadi Systems have caused severe damages, especially in the Arab regions. Human life, infrastructure such as roads and buildings as well as the environment are endangered and have been heavily destroyed. Flash floods are caused by extreme weather conditions, their occurrence is highly random and the associated problems are expected to increase in the near future due to climate change. On the one hand, there is an urgent need for flash flood protection and risk reduction, on the other hand, this rainwater can also be considered as a new resource for water harvesting.

Finding solutions to these challenging problems requires close collaboration between scientists – established as well as young ones, - practitioners, and stakeholders from federal and public organizations. So we encourage you to contribute to the development of future solutions and to widen your own expertise and profile by attending the international symposium.



This event is the second in a new series of annual *International Symposia on Flash Floods in Wadi Systems*. Furthermore this symposium is supported by the *Water Resources Research Center (WRRC)* and the *Global Alliance of Disaster Research Institutes (GARDI)* of the *Disaster Prevention Research Institute (DPRI)*, *Kyoto University, Japan* and *Deutsches Wissenschaftszentrum Kairo (DWZ)*. The *First International Symposium on Flash Floods in Wadi Systems* held in October 2015 in Kyoto, Japan, was attended by about one hundred scientists, practitioners and stake holders from 11 countries (Japan, Arab Region, Europe; see <http://ecohyd.dpri.kyoto-u.ac.jp/en/index/1.html>). The *Second International Symposium on Flash Floods in Wadi Systems* consists of oral and poster presentations. It is complemented by a Training Workshop on *Numerical Modelling of Extreme Flash Floods in Arid Region* funded by the *UNESCO Office Cairo*.

Symposium Themes: Flash Floods in Wadi Systems

- Forecasting: modelling, monitoring, warning systems, management
- Mitigation measures and innovative technologies: risk assessment, dams, drainage channels
- Water harvesting: groundwater recharge, reservoirs, sedimentation, ecosystem
- Social aspects: public participation, land use and urban planning
- Case studies: Arabic region, international; excursion to local Wadi
- UNESCO session: urgent capacity development for managing natural disaster risks of flash floods in Egypt, Jordan, Sudan and Yemen

International Scientific Committee

- Dr. Saif Al Hinai, Water Management Systems, Oman
- Prof. Reinhard Hinkelmann, TU Berlin, Germany
- Prof. Ekkehard Holzbecher, German University of Technology, Oman
- Prof. Sameh Kantoush, WRRC, DPRI, Kyoto University, Japan
- Prof. Heiko Sieker, IPS Hoppegarten & TU Berlin, Germany
- Prof. Tetsuya Sumi, WRRC, DPRI, Kyoto University, Japan
- Prof. Hirokazu Tatano, Secretary-General GADRI, Kyoto University, Japan
- Prof. Uwe Tröger, TU Berlin Campus El Gouna, Germany
- Dr. Abdelaziz Zaki, Science National Professional Officer, UNESCO-Cairo

We are very confident that the symposium will contribute to the advancement of knowledge in dealing with flash floods in Wadi Systems. We are expecting more than 50 participants from 14 countries. The Organizing Committee would like to very specially acknowledge the organizations mentioned on the previous page for their generous support, the International Scientific Committee for its advice as well as all other persons who contributed to the success of the event.

Berlin, Germany; Kyoto, Japan; El Gouna, Egypt

Uwe Tröger, Reinhard Hinkelmann, Sameh Kantoush and Franziska Tügel

October 2016

List of Speakers

Algeria: Prof. Dr. Khedidja. Boukharouba, University of Biskra, Algeria

Egypt: Dr. Islam Sabry Al Zayed, Water Resources Research Institute (WRII)

Egypt: Dr. Mohamed Abdel Aty, Minister of Water Resources and Irrigation

Egypt: Dr. Mohamed Attwa, Zagazig University, Faculty of Science, Geology department

Egypt: Prof. Noha Donia, Institute of environmental studies and researches, Ain Shams University

Egypt: Prof. Dr. Mohamed El-Bastawesy, National Authority for Remote Sensing

Egypt: Mr. Hisham ElDardiry, Department of Civil Engineering, Alexandria University

Egypt: Prof. Dr. Dia El Din El Quosy, National Coordinator of Egypt for UNESCO project

Egypt: Dr. Salah Shehata, Ministry of Water Resources and Irrigation, General Directorate of Ground Water for Eastern Desert

Egypt: Dr. Abdelaziz Zaki, UNESCO- Cairo

Germany: Dr. Andreas Becker, Deutscher Wetterdienst, Offenbach

Germany: Dr. Ahmed Hadidi, TU Berlin

Germany: Prof. Dr.-Ing. Reinhard Hinkelmann, TU Berlin

Germany: Prof. Dr. Ekkehard Holzbecher, GUTech, Oman

Germany: Mr. Christian Melchert, German Science Center Cairo (DWZ)

Germany: Prof. Dr. Uwe Tröger, TU Berlin

Germany: Ms. Franziska Tügel, TU Berlin

Italy: Prof. Marco Borga, University of Padova

Japan: Mr. Mohamed Abdelfatah, Ph.D. Student, DPRI, Kyoto University

Japan: Mr. Yoichi Iwami, Chief Researcher, ICHARM

Japan: Associate Prof. Sameh Kantoush, DPRI, Kyoto University

Japan: Mr. Yosuke Kawamoto, First secretary of Economic Section, Embassy of Japan to Egypt

Japan: Mr. Naoto Mizuno, Yachiyo Engineering Co., Ltd

Japan: Prof. Dr. Tetsuya Sumi, DPRI, Kyoto University

Japan: Dr. Morimasa Tsuda, Senior Researcher, ICHARM

Jordan: Eng. Bany-Mustafa, Ministry of Water and Irrigation, MWI

Morocco: Prof. Dalila Loudyi, University Hassan II Mohammedia-Casablanca

Oman: Eng. Ahmed Al Barwani, Ministry of Regional Municipalities and Water Resources

Oman: Dr. Saif Al Hinai, Water Management Systems, Special Economic Zone Authority

Saudi Arabia: Prof. Ahmed Elfeki, King Abdulaziz University, Kingdom of Saudi Arabia

Saudi Arabia: Prof. H. A. R. Ewea, King Abdulaziz University, Kingdom of Saudi Arabia

Sudan: Prof. Dr. Gamal Abdo, Water Research Center, University of Khartoum

United Arab Emirates: Prof. Dr. Tarek Merabtene, University of Sharjah, UAE

USA: Prof. Emad Habib, University of Louisiana at Lafayette

Yemen: Prof. Abdulla Noaman, Sanaá University Faculty of Engineering

Schedule Overview

	Day	Activity
1	Sunday; 23 rd October	Arrival in Egypt, and stay in El Gouna
2	Monday; 24 th October	UNESCO Training Workshop /Symposium Registration and in the evening Come Together (Symposium ice breaker)
3	Tuesday 25 th October 1 st day of 2 nd ISFF	8h00 -9h00 Registration 9h00 – 10h00 Welcome Messages from TUB, KU, Embassy of Japan in Egypt, UNESCO 10h00 – 11h20 Keynote I and 2 oral presentations 11h20 – 11h50 Coffee Break 11h50 – 13h05 3 Oral Presentations 13h05 – 14h15 Lunch Break 14h00 – 15h00 Poster Session 1 st Part 15h00 – 16h15 3 Oral Presentations 16h15 – 16h45 Coffee Break 16h45 – 18h00 3 Oral Presentations 19h15 to 21h15 Official Dinner by Invitation Cards
4	Wednesday 26 th October 2 nd day of the 2 nd ISFF	8h30 -9h00 Keynote II 9h00 – 9h50 2 Oral Presentations 09h50 – 10h20 Coffee Break 10h20 – 12h25 UNESCO Session (5 Oral Presentations) 12h25 – 13h25 Lunch Break 13h25 – 13h55 Keynote III 13h55 – 14h45 2 Oral Presentations 14h45 – 15h15 Coffee Break 15h15 – 15h30 German Science Center & Egyptian German Water Cluster 15h30 – 16h45 3 Oral Presentations 16h45 – 17h30 Poster Session 2 nd Part 17h30 – 18h20 2 Oral Presentations
5	Thursday 27 th October 3 rd day of 2 nd ISFF Closing & excursion	8h30 -10h30 Roundtable discussion (Where are we on the roadmap to reach a better protection / Final discussion about potential proposal (including 3 Oral Presentations) 10h30 – 11h45 Closing and Symposium Statement 12h00- 16h00 Wadi Excursion in Safaga

Official Symposium Opening Ceremony







Monday 24th of October 2016

14:30-17:00 *Registration (TU Berlin Campus El Gouna)*
Chaired by: Uwe Tröger (TU Berlin Campus El Gouna, Germany)

17:30 – 19:30	Come Together at TU Berlin Campus El Gouna
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2016 Symposium Programme

First Day: Tuesday 25th October 2016

8:30-9:00 Participants Registration Chaired by: Associate Sameh Kantoush (WRRC, DPRI, Kyoto University, Japan)		
9:00 – 10:00	Opening Session (Audimax)	
	 Opening Remarks and Guest Welcome	Uwe Tröger (<i>Central Institute El Gouna, TU Berlin, Germany</i>)
	 Water Resources and Flash Floods Management in Egypt by Ministry of Water Resources and Irrigation	Mohamed Abdel Aty (<i>Minister of Water Resources and Irrigation</i>)
	 Message from the Representative of Embassy of Japan to Egypt Regarding the Efforts for Disaster Risk Reductions	Yosuke Kawamoto (<i>First Secretary of Economic Section, Embassy of Japan to Egypt</i>)
	 Message from the Representative of Embassy of Germany and/or DAAD	On request
	 Welcome speech by UNESCO Representative	Abdelaziz Zaki (<i>UNESCO Cairo Office, Egypt</i>)
	 Symposium Objectives and Roadmap	Tetsuya Sumi (<i>WRRC, DPRI, Kyoto University, Japan</i>)
10:00 – 11:20	Session 1-1: Forecasting: Modelling, Monitoring, Warning System, and Management (Lecture Hall 5 Room G14) Chaired by: Uwe Tröger (TU Berlin Campus El Gouna, Germany)	
Keynote I		
10:00 – 10:30 (20 minutes and 10 minutes discussion)	❖ DWD Capabilities in the Field of Extreme Flash Flood Generating Precipitation with a view on Forecast, Monitoring, Warning and Hydro-Climatological Assessment	Andreas Becker (<i>Precipitation Monitoring Unit and Global Precipitation Climatology Centre, Deutscher Wetterdienst, Germany</i>)
10:30 – 10:55 (15 min and 10 min discussion)	★ Integrated Multidisciplinary Approach for Flash Floods Modelling, Forecasting and Mitigation: the Way Forward to Sustainable Development of Wadi Basins	Sameh Kantoush (<i>WRRC, DPRI, Kyoto University</i>)
10:55 – 11:20 (15 min and 10 min discussion)	★ Omani Experience in Flash Floods, Disaster Risk Reduction and Water Harvesting	Ahmed Said Al Barwani (<i>Ministry of Regional Municipalities and Water Resources, Sultanate of Oman</i>)
11:20 – 11:50	Coffee Break & Group Photograph	

11:50 – 13:05	Session 1-2: Forecasting: Modelling (15 minutes presentation and 10 minutes discussion) Chaired by: Reinhard Hinkelmann (TU Berlin Campus El Gouna, Germany)	
11:50 – 12:15	★ Flash Floods of Wadi Bili, 9 March 2014	<i>Ahmed Hadidi (Central Institute El Gouna, TU Berlin, Germany)</i>
12:15 – 12:40	★ Shallow Water Flow Based Simulation of Flash Floods in Small Catchments	<i>Franziska Tügel (Chair of Water Resources Management and Modeling of Hydrosystems, TU Berlin, Germany)</i>
12:40 – 13:05	★ Coarse Grid Strategies for Computationally Efficient Flash Flood Simulations	<i>Reinhard Hinkelmann (Chair of Water Resources Management and Modeling of Hydrosystems, TU Berlin, Germany)</i>
13: 05 – 14:00	<i>Lunch Break</i>	
14:00 – 15:00	Poster Session: All participants Chaired by: Tetsuya Sumi (WRRC, DPRI, Kyoto University, Japan)	
15:00 – 16:15	Session 1-3: Mitigation Measures and Innovative Techniques (15 minutes presentation and 10 minutes discussion)	
15:00 – 15:25	★ Distributed Hydrological Modeling at Wadi Samail, Oman	<i>Mohammed Abdel-Fattah (Kyoto University, Japan)</i>
15:25 – 15:50	★ Application of Fuzzy Logic to the Management of Flash-Flood Gates	<i>Tarek Merabtene (University Of Sharjah, UAE)</i>
15:50 – 16:15	★ Highly Flexible Rainfall-Runoff Model Using Multiple Spreadsheets	<i>Ahmed Elfeki (King Abdulaziz University, Kingdom of Saudi Arabia)</i>
16: 15 – 16:45	<i>Coffee Break</i>	
16:45 – 18:25	Session 1-4: Case Studies: Arabic Region, International (15 minutes presentation and 10 minutes discussion) Chaired by: Emad Habib (University of Louisiana at Lafayette, USA)	
16:45 – 17:10	★ ICHARM's Initiatives for Effective Flash Flood Forecasting and Management in Arid and Semi-Arid Region	<i>Yoichi Iwami (International Centre for Water Hazard and Risk Management (ICHARM), PWRI, Japan)</i>
17:10 – 17:35	★ Application of Flood Forecasting and Analysis Model (IFAS) for Wadi Flash Flood	<i>Morimasa Tsuda (International Centre for Water Hazard and Risk Management (ICHARM), PWRI, Japan)</i>
17:35 – 18:00	★ Debris Flow Disaster Mitigation Project in Mt. Merapi Area, Indonesia	<i>Naoto Mizuno (Yachiyo Engineering Co., Ltd., Japan)</i>
19: 15 – 21:00	<i>Official Dinner in The Three Corners Rihana for invited participants</i>	

2016 Symposium Programme

Second Day: Wednesday 26th of October 2016

8:30 – 9:50	Session 2-1: Radar and Satellite Data Chaired by: Andreas Becker (Precipitation Monitoring Unit and Global Precipitation Climatology Centre, Deutscher Wetterdienst, Germany)	
Keynote II 8:30 – 9:00 (20 min & 10 min discussion)	❖ Radar and Satellite Techniques for Rainfall Monitoring and Flood Forecasting in Arid Regions: Current Challenges and Future Opportunities	Emad Habib (University of Louisiana at Lafayette, USA)
9:00 – 9:25 (15 min & 10 min discussion)	★ Observing Flash Flood in Arid and Semi-Arid Regions from Space: Wadi Watier in Sinai of Egypt as a Case Study	Islam Sabry Al Zayed (Water Resources Research Institute (WRI), National Water Research Center (NWRC), Egypt)
9:25 – 9:50 (15 min & 10 min discussion)	★ The Use of Remote-Sensing Based Multi-Sensor Quantitative Precipitation Estimates in Deriving Extreme Precipitation Frequencies: Implications for Flash Flood Monitoring	Hisham ElDardiry (Alexandria University, Egypt)
9:50 – 10:20	Coffee Break	
10:20 – 12:25	Session 2-2: UNESCO Session: Urgent Capacity Development for Managing Natural Disaster Risks of Flash Floods in Egypt, Jordan, Sudan and Yemen (15 minutes presentation and 10 minutes discussion) Chaired by: Ahmed Said Al Barwani (MRMWR, Sultanate of Oman)	
10:20 – 10:45	★ UNESCO-Japan Fund in Trust Project on <i>Urgent Capacity Development for Managing Natural Disaster Risks of Flash Floods in Egypt, Jordan, Sudan and Yemen</i>	Abdelaziz Zaki (UNESCO Cairo Office (UCO), Egypt)
10:45 – 11:10	★ Urgent Capacity Development for Managing Natural Disaster Risks of Flash Floods in Wadi Abu Sbiera, Aswan, Egypt	Dia El Din El Quosy (National Coordinator of Egypt for UNESCO project, Egypt)
11:10 – 11:35	★ Capacity Development for Managing Disaster Risks of Flash Floods in Sudan	Gamal M. Abdo (Water Research Centre, University of Khartoum, Sudan)
11:35 – 12:00	★ Jordanian Experience Regards Flash Flood Risk Reduction	Bany-Mustafa (Ministry of Water and Irrigation, MWI, Jordan)

12:00 – 12:25	★ Flood Hazard Assessment and Mapping in Semi-Arid Urban Areas: A Case Study in the Wadi Al-Sayelah, Sana'a, Yemen	Abdulla Noaman (Sanaá University Faculty of Engineering, Yemen)
12:25 – 13:25	<i>Lunch Break</i>	
13:25 – 14:45	Session 2-3: Mitigation Measures and Social Aspects Chaired by: Gamal Abdo (University of Khartoum, Sudan)	
Keynote III 13:25 – 13:55 (20 min & 10	❖ Flash Floods in Oman	Ekkehard Holzbecher (German University of Technology in Oman, Sultanate of Oman)
13:55 – 14:20 (15 min & 10	★ Flood Risk Management in Morocco: Facts and Adaptation Measures	Dalila Loudyi (Water and Environmental Engineering, University Hassan II - Casablanca, Morocco)
14:20 – 14:45 (15 min & 10 min discussion)	★ Environmental Monitoring and Evaluation of Flash Floods Risks using Remote Sensing and GIS Techniques - A Case Study of Wadi Firan, Sinai	Noha Donia (Environmental Engineering Department, Ain Shams University, Egypt)
14:45 – 15:15	<i>Coffee Break</i>	
15:15 – 15:30	German Science Center (DWZ) and Egyptian German Water Cluster by Christian Melchert (German Science Center Cairo (DWZ)) Chaired by: Reinhard Hinkelmann (TU Berlin Campus El Gouna, Germany)	
15:30 – 16:45	Session 2-4: Water Harvesting: Groundwater Recharge, Reservoirs, Sedimentation, Ecosystem (15 minutes presentation and 10 minutes discussion) Chaired by: Ahmed Sefelnasr (Assiut University, Egypt)	
15:30 – 15:55	★ Aquifer Recharge of Flash Flood Water – How to Prevent Clogging	Uwe Tröger (Central Institute El Gouna, TU Berlin, Germany)
15:55 – 16:20	★ The Impact of Flash Floods on Waste Water Disposal Sites within the Wadi Systems in the Eastern Desert of Egypt: Case Study for Wadi Al Saaf	Mohammed El Bastawesy (The national authority for remote sensing and space sciences, Egypt)
16:20 – 16:45	★ How Efficient is an Integrative Approach of GIS and Resistivity Data in Groundwater Exploration? A Case Study of Esna, Luxor, Egypt	M. Attwa (Geology Department, Faculty of Science, Zagazig University, Egypt)
16:45 – 17:30	2nd Part of Poster Session: All participants Chaired by: Tetsuya Sumi (WRRC, DPRI, Kyoto University, Japan)	

17:30 – 18:20	Session 2-5: Hydrological Modelling (15 minutes presentation and 10 minutes discussion) Chaired by: Dalila Loudyi (University Hassan II, Morocco)	
17:30 – 17:55	★ Kalman Filter and Box-Jenkins Techniques for Monthly and Annual Streamflows Prediction in Northern	K. Boukharouba (University of Biskra, Algeria)
17:55 – 18:20	★ Empirical Equations for Estimation of Transmission Losses Based on Field Measurements in Ephemeral Streams	H. A. R. Ewea (King Abdulaziz University, Saudi Arabia)

2016 Symposium Programme

Third Day: Thursday 27th of October 2016

8:30 – 10:30	Roundtable Discussion Chaired by: Sameh Kantoush (DPRI, Kyoto University, Japan)	
	Roundtable Discussion: Where are we on the road map to reach a better protection, use, and understanding of Flash Floods in Wadi Systems?	
8:30 – 9:00	Summaries and Outcomes of TU Berlin	Uwe Tröger (Central Institute El Gouna, TU Berlin, Germany)
9:00 – 9:30	Research Challenges and Future Research Collaboration	Sameh Kantoush (DPRI, Kyoto University, Japan)
9:30 – 10:00	Open Discussion and Statement	All
10:30 – 11:45	Closing Session: Symposium Statement and Closing Chaired by: Uwe Tröger (Central Institute El Gouna, TUB, Germany)	
10:30 – 10:55	❖ Flash Flood research in HYMEX	Marco Borga (University of Padova, Italy)
10:55 – 11:10	★ The Third International Symposium on Flash Floods in Wadi Systems (3 rd ISFF)	Ekkehard Holzbecher (German University of Technology, Sultanate of Oman) Saif Al Hinai (Water Management Systems, Sultanate of Oman)
11:10 – 11:30	★ Wadi Excursion presentations and details about mitigation measures in Safaga dam	Salah Shehata (Ministry of Water Resources and Irrigation, General Directorate of Ground Water for Eastern Desert, Egypt)
11:30 – 11:45	★ Symposium statement and Best Poster Awards	Tetsuya Sumi (WRRC, DPRI, Kyoto University, Japan)

Wadi Excursion Program on Thursday 27th of October 2016

12:00 – 16:00	Wadi Excursion to Safaga Chaired by: Uwe Tröger (Central Institute El Gouna, TUB, Germany)
12:00 – 13:15	Bus will depart from TU Berlin El Gouna Campus to Safaga city to visit various dams (100Km). Please see the maps and information. Lunch boxes and water will be available in the bus.
13:15 – 14:45	After arrival in Safaga we will visit various flash flood mitigation dams according to the available time as Abou-Maya, El-Baroud El-Abyadd, Gasous, and Safaga dams. Please see the information sheet about the excursion.
14:45 – 16:00	<i>Return to TU Berlin El Gouna Campus</i>

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Session 1-1: Forecasting: Modelling, Monitoring, Warning System and Management

Session 1-2: Forecasting: Modelling

Session 1-3: Mitigation Measures and Innovative Techniques

Session 1-4: Mitigation Measures and Innovative Techniques

Session 2-1: Radar and Satellite Data

Session 2-2: UNESCO Session: Urgent Capacity Development for Managing Natural Disaster Risk of Flash Floods in Egypt, Jordan, Sudan and Yemen

Session 2-3: Mitigation Measures and Social Aspects

Session 2-4: Water Harvesting: Groundwater Recharge, Reservoirs, Sedimentation, Ecosystem

Session 2-5: Hydrological Modelling

Closing Session: Symposium Statement and Closing

Abstracts for Poster Session